

CLAIMS

1. A method of determining the pressure of a gas within an engine relative to a pre-defined pressure of the gas,

5 comprising the steps of:

(a) measuring the power factor of electricity generated by the engine;

(b) comparing the measured power factor with a power factor determined to correspond to the power factor of 10 electricity generated by the engine when operating at the pre-defined pressure; and

(c) determining whether the measured power factor is less than the determined power factor.

15 2. A method of operating an engine containing a working gas comprising the steps of:

(a) measuring repeatedly the power factor of electricity generated by the engine when running;

20 (b) comparing measured power factors to a pre-defined power factor determined to correspond to the power factor of electricity generated by the engine when operating such that the working gas within the engine is at a pre-defined pressure; and

(c) producing an alarm when a measured power factor is 25 found to be less than the determined power factor.

3. A method of operating a Stirling engine according to claim 2.

30 4. A method of operating a Stirling engine of a domestic combined heat and power unit according to claim 3.

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5. A method according to any of claims 2 to 4 wherein the engine is connectable to an electrical grid and step (b) of the method comprises comparing power factors measured when the engine was isolated from the electrical grid.

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6. A method according to claim 5, wherein step (b) of the method comprises comparing power factors measured during start-up of the engine.

10 7. A method according to any of claims 2 to 6, wherein step (b) comprises comparing the measured power factor with a pair of determined power factors and step (c) comprises producing an alarm if a measured power factor is found to be less than the higher of the determined power factors and
15 shutting down the engine if a measured power factor is found to be less than the lower of the determined power factors.

8. A method according to any of claims 2 to 7, wherein the determined power factor or factors is/are determined
20 empirically.

9. A method of operating an engine containing a working gas comprising the steps of:

25 (a) measuring repeatedly the power factor of electricity generated by the engine when running;
(b) storing the measured power factors;
(c) analysing at least some of the stored power factors to identify any variation across the power factors; and
30 (d) producing an alarm when a variation beyond an acceptable limit is identified.

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10. The method of claim 9, further comprising shutting down the engine when the variation is beyond the acceptable limit.

5 11. The method of claim 9, further comprising distinguishing between a gradual variation and an abrupt variation, and providing an alarm when a gradual variation is identified and providing an alarm and shutting down the engine when an abrupt variation is identified.

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12. An engine unit comprising:
an engine containing a working gas;
a power monitor operable to produce a power factor signal representative of the power factor of electricity generated by the engine;

control means configured to receive the power factor signal; and

an alarm;

wherein the control means is operable:

20 to use the power factor signal to determine whether the power factor of the engine is less than a pre-determined power factor that corresponds to the power factor of electricity generated by the engine running with the working gas at a pre-defined pressure; and

25 to operate the alarm if the power factor is determined to be less than the pre-determined power factor.

13. An engine unit comprising:

an engine containing a working gas;

30 a power monitor operable to produce a power factor signal representative of the power factor of electricity generated by the engine;

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control means configured to receive the power factor signal; and

an alarm;

wherein the control means is operable:

5 to store the measured power factors;

to analyse at least some of the stored power factors to identify any variation across the power factors; and

10 to produce an alarm when a variation beyond an acceptable limit is identified.

14. A computer when programmed to perform the following steps:

to receive from a power monitor a power factor signal representative of a power factor of electricity generated by
15 an engine containing a working gas;

to use the power factor signal to determine whether the power factor of the engine is less than a pre-determined power factor value stored in memory that corresponds to the power factor of electricity generated by the engine running
20 with the working gas at a pre-defined pressure; and

to create an alarm if the power factor is determined to be less than the pre-determined power factor.

15. A computer when programmed to perform the following
25 steps:

to receive repeatedly from a power monitor a power factor signal representative of a power factor of electricity generated by an engine containing a working gas;

30 to store the measured power factors in a memory;

to analyse at least some of the stored power factors to identify any variation across the power factors;

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to compare any variation found with an acceptable limit stored in a memory; and

to create an alarm when the compared variation is found to exceed the acceptable limit.

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16. A computer program comprising computer program instructions that, when loaded into a computer, cause it to operate as defined in either claim 14 or claim 15.

10 17. A computer program product comprising a recordable medium having recorded thereon a computer program in accordance with claim 16.